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## SLAB-COUPLED OPTICAL WAVEGUIDE LASER AND AMPLIFIER

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### PRIORITY INFORMATION

This application claims priority from provisional application Ser. No. 60/218,187 filed July 14, 2000.

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### BACKGROUND OF THE INVENTION

The invention relates to a slab-coupled optical waveguide laser (SCOWL) and amplifier.

Arnaud et al., U.S. Pat. No. 3,899,235 and Marcatili, Bell System Technical Journal, vol. 53, no. 4, pp.645-674, April, 1974, describe a theory of slab-coupled optical waveguides which shows that it is possible to construct a passive dielectric optical waveguide in which only the fundamental, lowest-order spatial mode propagates without loss. The lowest-order spatial mode represents a single-lobed distribution of light (or electromagnetic intensity) in both the lateral and transverse directions. The lateral and transverse directions are defined as being mutually perpendicular to each other and to the direction of wave propagation, i.e., the longitudinal direction. Conventionally, "lateral" refers to the dimension parallel to the epitaxial layers of the structure, while "transverse" refers to the dimension perpendicular to the layered structure.

The theory also includes design rules for constructing dielectric structures of this type. In general the structures consists of a dielectric slab that is very wide (infinitely wide, as described in the theory) in the lateral direction and a waveguiding region that is localized in the lateral and transverse directions. The dielectric slab and the localized waveguide can be described as two